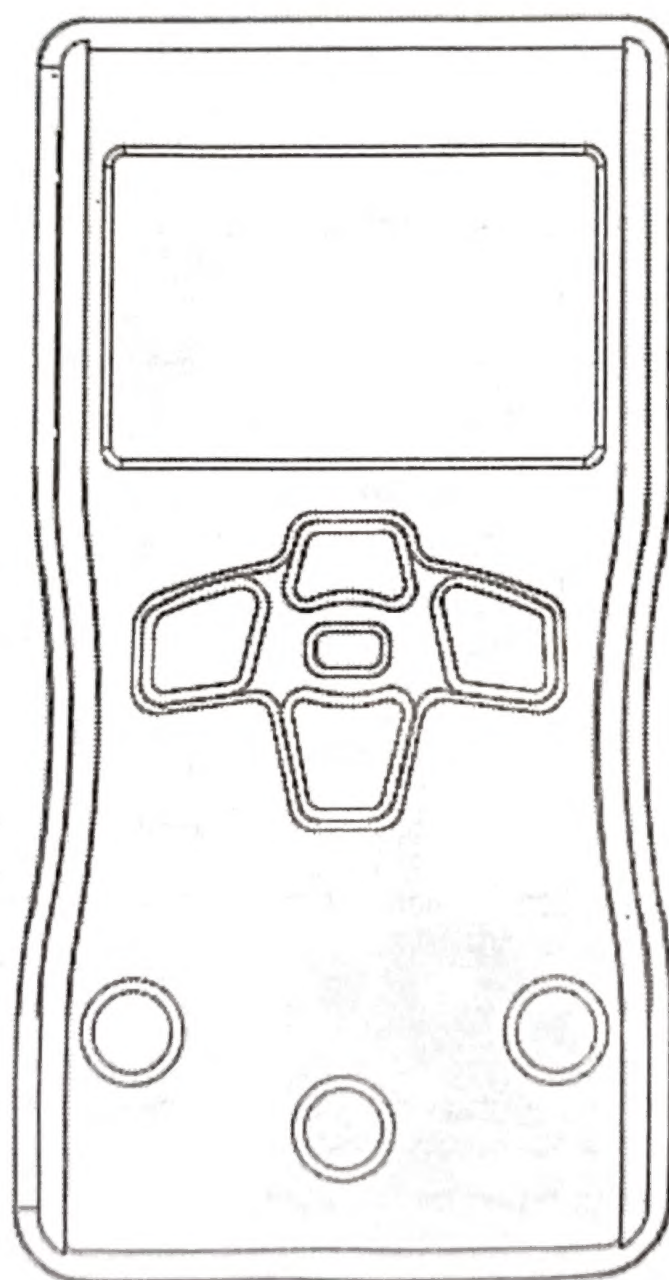


# Automatic Scanning Digital Multimeter

## User' Manual



## 一、 Overview

This series multimeter is a pocket 3 5/6 bit true effective value automatic scanning digital meter. Depending on the input voltage/current/resistance/equal signal, the instrument is capable of automatic identification measurement. The series of instruments have the characteristics of stable performance, high precision and clear reading. With the extra convenience of flashlight and non-contact voltage test, it is an ideal instrument for factory, teaching and electronics enthusiasts.

## 二、 Security matters

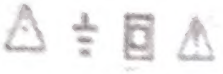

Design of the series of meters in accordance with the IEC1010 provisions (safety standards issued by the International Electrotechnical Commission), please read the safety precautions carefully before use the meter, the use of strict compliance with safety regulations, so as not to cause casualties or instrument damage.

1、 When measuring the voltage, do not input the limit voltage exceeding the effective value DC 600 V or AC 600V;

2、 The voltage below 36 V is safe voltage, when measuring the voltage above 36 V, please be sure to pay attention to safety. Because more than 36 V of voltage may cause damage to the human body;


3、 When changing function and range, the pen should leave the test point;

4、 Select the correct function and range, beware of wrong operation, although the series of instruments with full range protection function, but for the sake of safety, please pay more attention to safety;

5、  safety symbol states "hazardous voltage exists", "ground", "double insulation", "operator must refer to instruction", "low voltage symbol." 

### 三、Characteristics

#### 1、General characteristics

- 1-1、Display mode: LCD;
- 1-2、Maximum display :5999(3 5/6 bit automatic display);
- 1-3、How to measure: conversion A/D double integral fraction;
- 1-4、Sampling rate: about 3 times per second;
- 1-5、Excess range display: display "OL";
- 1-6、Low voltage display :"" symbol appears; 
- 1-7、Working environment :(0~40)°C, relative humidity <80%;
- 1-8、Electricity: Two batteries 7(AAA 2\*1.5V);
- 1-9、Volume size:118\*68\*30mm
- 1-10、Weight:100g without battery

#### 2. Technical characteristics

Accuracy :  $\pm$  (reading a%+ minimum effective digit), guaranteed accuracy environment: temperature  $(23 \pm 5)^{\circ}\text{C}$ , relative humidity <75%, calibration guarantee date one year.

2-2, performance ("▲" means the table has this function)

Function	
DC voltage	▲
AC voltage	▲
DC Current	▲
AC current	▲
Resistance/Diode, on-off test	▲
Capacitance testing	▲
Capacitance	▲
NCV	▲
Zero line/fire line test	▲
Full unit symbol	▲
Backlight manual/automatic shutdown	▲
Ac Validity Measurement	▲
Flashlight lighting	▲



### 3-1, DC/AC voltage measurement (DCV/ACV)

Range	Accuracy	Resolution
DC/AC 6V	$\pm(0.5\%+3)$	0.001 V
DC/AC 60V		0.01V
DC/AC 600V		0.1V

Input impedance :10 M  $\Omega$  ; Overload protection :600 V dc or 600 V ac peak.

### 3-2 Resistance Measurement ( $\Omega$ )

Range	Accuracy	Resolution
600 $\Omega$	$\pm(0.8\%+5)$	0.1 $\Omega$
6k $\Omega$	$\pm(0.8\%+3)$	1 $\Omega$
60k $\Omega$		10 $\Omega$
600k $\Omega$		100 $\Omega$
6M $\Omega$		1k $\Omega$
60M $\Omega$	$\pm(2.5\%+3)$	10k $\Omega$

Input impedance :10 M  $\Omega$  ;Overload protection :600 V dc or 600 V ac peak.

### 3-3 Diode/on-off test

Range	Display value	Test conditions
---	Diode forward pressure drop	Forward DC current about 1mA open circuit voltage V about 3
	The buzzer sounds long and the two-point resistance is less than $(50 \pm 20 \Omega)$ .	About 0.4 V open circuit voltage

Input impedance :10 M  $\Omega$  ; Overload protection :600 V dc or 600 V ac peak.

### 3-4 Measurement of capacitance (C)(IS33D models only)

Range	Accuracy	Resolution
10nF	$\pm(3.5\%+20)$	100pF
100nF		100pF
1uF		1nF
10uF		10nF
100uF		100nF
1mF		1uF
10mF		10uF
60mF	$\pm(5\%+3)$	100uF

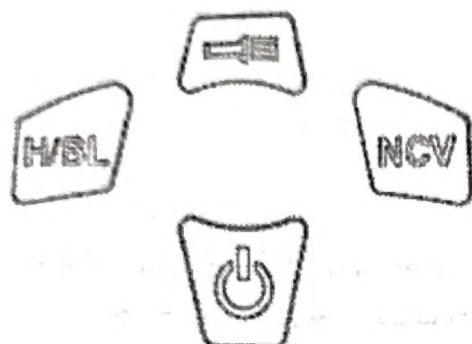
Overload protection :600 V DC or 600 V AC peak.

### 3-5, AC/DC current (DC/AC A)

Range	Accuracy	Resolution
6A	$\pm (2\%+30)$	0.001 A
10A		0.01A

Maximum measured pressure drop :600 mV; Overload protection :10 A

## 四、Operation Key Description



- 1、Flashlight trigger button;
- 2、NCV measurement key, long press NCV key can measure electric field induction signal;
- 3、H/BL for reading hold key, long press 2 seconds to light LCD screen backlight, about 15 seconds after the backlight automatically turned off;
- 4、Power button, long press 2 seconds to turn on/off the power supply, boot state this key for the function selection button, each light press switch once measurement function;

## 五、Operational guidance

### 5-1, DC/AC voltage automatic scan test (DCV/ACV)

1. Press the power key for more than 2 seconds to turn on the meter. The boot is shown as automatic scan "AUTO"..
2. insert black watch pen into "COM" jack, red watch pen insert "V/  $\Omega$ " jack, test watch pen reliable contact test point.
3. when the voltage between the input port "COM" and "V/  $\Omega$ " is greater than 0.5 V, the meter will compare according to the size of the DC component and AC component, take its larger component signal, and then automatically switch the range according to the size of the measured value, and then display the measured value on the LCD.
4. If it can not be measured in the environment of greater interference, trigger the power key to manually select DC or AC voltage measurement mode for measurement.

Note:

1. The input voltage must not exceed the DC 600 V or AC 600 V, if there is a risk of damage to the instrument circuit; when measuring more than 36 V voltage should pay special attention to safety to avoid the danger caused by electric shock;

2. After completing all measurement operations, disconnect the meter pen from the circuit under test.

### 5-2, Resistance measurement

1. Press the power key for more than 2 seconds to turn on the meter. boot auto scan status "AUTO"..



2. Insert black watch pen into "COM" jack, red watch pen insert "V/Ω" jack, test watch pen reliable contact test point.

3. If the measuring resistance at both ends of the meter pen is less than 50 Ω, the buzzer will make a continuous noise and requires a fast buzzer measurement, press the power key to manually select the buzzer fast measurement function.

4. If the resistance of the closed loop is measured, the two ends of the measured resistance must be treated for discharge, otherwise if the voltage in the loop is greater than 0.6 V, the instrument will be mistaken for the voltage measurement and enter the voltage measurement mode.

5. the resistance between the red and black meter pen is greater than 50 Ω, the meter will automatically switch the range according to the actual resistance measurement value, and then the measured value will be displayed in the LCD.

Note:

1、When measuring low resistance, in order to obtain accurate reading, you can first record the meter pen short circuit value, subtract the meter in the measurement reading

The value of the pen in short circuit;

2、When measuring the on-line resistance, all the power supply of the circuit must be turned off and all the capacitors are discharged to ensure the accuracy of the measured value.

#### 5-3, diode measurements

1. Press the power key for more than 2 seconds to turn on the meter. boot display as automatic scan state "AUTO", press power key to manually select diode measurement function.

2. Insert black watch pen into "COM" jack, red watch pen insert "V/Ω" jack, test watch pen reliable contact test point.

3. meter will show the positive pressure drop of the measured diode on the LCD. If the polarity of the two ends of the diode in contact with the pen is reversed or the diode is open, the LCD of the meter will show "OL".

#### 5-4, capacitance measurements

1. Press the power key for more than 2 seconds to turn on the meter. , boot display as automatic scan state "AUTO", press power key manually switch to capacitance measurement function.

2. Insert black watch pen into "COM" jack, red watch pen insert "V/Ω" jack, test watch pen reliable contact test point.

3. Meter will automatically switch the range according to the capacitance value between the red and black meters, and the specific value of the measured capacitance will be displayed on the LCD. The measuring range of the capacitance is 10 nF/100nF/1uF/10uF/100uF/1mF/10mF/60mF..

Note:

1、Please treat the measured capacitance to discharge fully before measuring the capacitance, otherwise it will enter the voltage measurement mode.

2、When measuring capacitance with 10 nF gear, the LCD display value may have



residual reading, the distributed capacitance of this digital meter pen, the bit accurate reading can subtract this value after measurement.

3、A LCD will show some values and instability when measuring serious leakage or breakdown capacitance at large capacitance files; when measuring large capacitance, the reading takes a few seconds to stabilize, which is normal when measuring large capacitance.

4、Unit 1 F=1000 mF 1mF=1000 uF uF=1000 nF nF=1000 pF

#### 5-5, Current Test Function (DC/AC A)

1. Press the power key for more than 2 seconds to turn on the meter. The boot is shown as automatic scan "AUTO"..

2. Insert black watch pen into "COM" jack, red watch pen insert "10 A" jack, test watch pen reliable contact test point.

3. Input current greater than 20 mA between the input port "COM" and "10 A", the meter will display the current value with large de-component on the LCD according to the magnitude of the AC / DC component.

Note:

1、Before the instrument is connected in series to the circuit to be tested, the power in the circuit should be turned off first;

2、Maximum input current is 10 A( depending on the red meter pen insertion position), too much current will burn out the internal fuse, be careful, each measurement time must not be more than 10 seconds, too much current or too long measurement time will make the instrument circuit heating, or even damage the instrument;

3、Do not connect the meter pen test pin parallel to any circuit when the red meter pen is inserted in the "10 A" port, this will damage the fuse and meter.

4、After all the measurement operations are completed, the power supply should be turned off first and then the connection between the meter pen and the measured circuit should be disconnected.

5、No more than 36V DC or 25V AC voltage is entered between port 10 and port COM".

#### 5-6, NCV measurements

1. Press the power key for more than 2 seconds to turn on the meter. Press 'NCV' key to enter EF measurement, Keep pressing the key .

2. Instrument has the NCV test induction end, the induction end is close to the AC voltage side, according to the signal intensity, the buzzer will make a continuous sound of different frequencies, at the same time, the LCD will still display different segments according to the signal strength.

## VI. Automatic Switching Machine

The instrument has the function of automatic shutdown, when the instrument stops using for 15 minutes, the instrument will automatically power off into the dormant state; to restart the power supply, hold down the power key more than 2 seconds, wake up the instrument into the automatic scanning measurement state, the LCD shows "AUTO". If you want to cancel the

automatic shutdown function, press "HOLD" key and power key simultaneously to wake up the instrument in the instrument dormant state, at this time the automatic shutdown function of the instrument will be cancelled.